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PDP-11

DECnet/E, PHASE II

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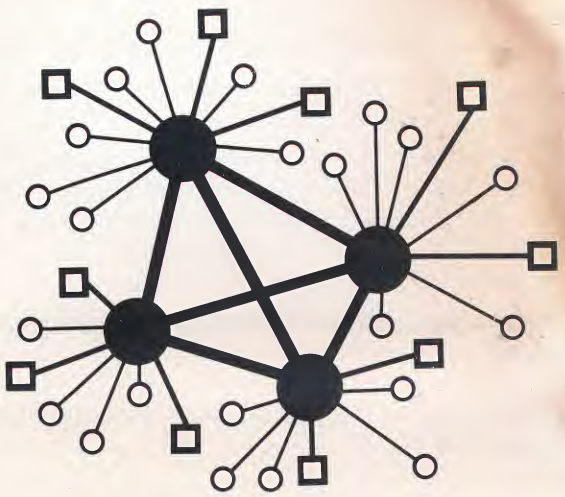
SEPTEMBER 1978

DECnet is a set of communication products that provides networking capabilities for all DIGITAL computer families.

All DECnet products are designed around a common architecture. The key to this architecture, and thus to all DECnet products, is a general interconnection capability between individual DECnet systems. This means that as the user chooses from the wide range of DIGITAL computers and operating systems supported by DECnet for each node, the flexibility and manner in which these systems are to communicate are preserved. Hierarchical, distributed computing, and resource sharing networks, and combinations of these, are all supported.

Additionally, inter-system communication is independent of the type of links used between DECnet systems. DECnet supports communication over parallel, serial asynchronous, and serial synchronous facilities. This allows users to match communications line costs and performance to application needs.

The following discussion provides information about those specific DECnet features available to the DECnet-RSTS/E user. Contact your local DIGITAL sales representative for a full description of the product's capabilities.



DECNET/E FEATURES

- Transmits and maintains data integrity between two adjacent nodes of a network.
- BASIC and BASIC-PLUS-2 tasks can interact with other tasks executing in the DECnet environment.
- Inter-system file transfer
- Includes software utilities to monitor network activity, provide inter-system operator communications, and aid network maintenance.

DESCRIPTION

DECnet functions fall into two major classes: communications functions and user/program functions. Communication functions, which describe how messages/information are transmitted between nodes of a network, are of interest to network administrators who must coordinate communication flow within the network. User/program functions are of primary interest to local users since they specify which DECnet functions are locally available, or available at other nodes of the network.

Communications Functions

DECnet/E supports serial synchronous point-to-point communications; that is, it provides the ability to transmit and maintain data integrity between any two adjacent nodes. Various topologies can be built based on this point-to-point capability.

User/Program Functions

DECnet/E provides a variety of user/program functions. These functions are described below.

Task-to-task Functions — Using DECnet/E, a RSTS/E user program written in BASIC or BASIC-PLUS-2 can exchange messages with other user programs using DECnet protocols. The two user programs can be on the same or adjacent DECnet nodes (adjacent nodes control opposite ends of a point-to-point communication line). If the program is on an adjacent node, the second node can be any DECnet system that supports synchronous communication lines. The DECnet messages sent and received by the two user programs can be in any data format. Each message segment can be up to 512 bytes long, or less if limited by capabilities of the communication line or the remote DECnet mode.

File Transfer Capabilities — Using DECnet/E utilities, a user can transfer sequential ASCII files between DECnet nodes. Files can be transferred in both directions between a locally supported RSTS/E RMS-11 device and the file system of an adjacent DECnet node. In addition, other types of files may be transferred where formats between the DECnet nodes are compatible. Additional facilities allow batch command files to be submitted to a remote node where the list of commands must be in the format expected by the node responsible for the execution. DECnet/E also allows batch files to be received from other systems and executed.

File Transfer Capabilities — Using the VAX/VMS COPY
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ween D nodes. Files ferred in both
X/VMS device
node. The
sequential file
ddition, other
s between
lities
remote
e format

to be
ability
it data

Remote File Access — Remot
RT-11 user to read from and
remote system. Programs
MACRO-11 on an RT-11
commands to be exec
network. Fixed and variat
supported. Further, files access
either ASCII or binary informatic

s lo n
formats
contain

Utility Programs

DECnet/RT utility programs inclu

- A Terminal Communication U
ators to send messages thro
operators at remote termina
- A Network Information Progr
display the status of DECne local

Networking Capabilitie

The combined attributes of D powerful d vices
cations and user/progra with its flex come
concept allow users to bu nd different
that match an organizatio re and needs. The fo
lowing examples show how t can be used to bu
hierarchical, distributed co , and resource sha
networks.

Hierarchical Networks — mple of a hierarchical
network is a process contr in a factory that
utilizes minicomputer-contr ools. By itse
each minicomputer i its own
machine tool, bu
production line.

ent network status,
their state, be printed at

Adding a single
mini, permits c
computer re s such as
supervisory network parameters,
make optim activating the local node,
failed one is r Cnet-11S systems.

With the hel of diagnostic tests.
higher level
puters in
control of DECn powerful
integrate user/program functions with its
tion da cept allow users to build varied and
central that match an organization's structure
then co ollowing examples show how DECnet can
build hierarchical, distributed computing and
resource sharing networks.

Hierarchical Networks — An example of a hierarchical network is a process control system in a factory that utilizes minicomputer-controlled machine tools. By itself, each minicomputer can monitor and control its own machine tool, but it cannot interact with other tools on the production line.

Adding a single supervisory computer, connected to each mini, permits optimizing of the line as a whole. If a minicomputer reports the breakdown of its machine tool, the supervisory computer can adjust the flow of materials to make optimum use of the rest of the machines while the failed one is repaired.

With the help of specialized application programs, a still higher level system, connected to all the supervisory computers in a whole plant, can be added. This permits total control of the production process. In addition, it permits integrated production reports for the entire plant. Production data from each control minicomputer is fed to the central computer through the supervisory machines and then consolidated into integrated reports for plant management.

Distributed Computing Networks — A general distributed network can be designed to take maximum advantage of participating systems by sharing tasks.

An airlines reservation system, for example, terminals at te ticket offices are tied to a terminal concentrator to duce line costs. Each terminal concentrator packages vidual messages for more efficient transmission over g -speed lines to the main office. As these message packages reach the main facility, each request is routed to the proper computer. In this example, one mini may handle data base computing—keeping track of planes and fares. Another performs numeric operations—accounting and fare computation. A third handles ticket and seat assignments. Results are sent back, through the network, to the individual terminals.

ddition to having speed and cost advantages, this type of network gains by its modular construction. Any increased need can be met directly, without the need to upgrade other network parts.

Resource Sharing Networks — A resource sharing network provides an opportunity to markedly reduce total system cost by sharing major system components among several small systems.

For example, in a laboratory system, small core-only systems with communications capabilities allow local users to access the entire resources of a large remote system for data acquisition and instrument control.

The remote systems can control instruments, acquire data, and send it to the central system for storage. They can also support standard peripherals, such as a graphics display processor.

HARDWARE AND SOFTWARE ENVIRONMENTS

DECnet-VAX runs on any valid VAX/VMS system configuration that meets the following minimum configuration requirements:

- 256K bytes dedicated memory
- One or more serial synchronous communications devices